

**This Page Is Inserted by IFW Operations
and is not a part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- **BLACK BORDERS**
- **TEXT CUT OFF AT TOP, BOTTOM OR SIDES**
- **FADED TEXT**
- **ILLEGIBLE TEXT**
- **SKEWED/SLANTED IMAGES**
- **COLORLED PHOTOS**
- **BLACK OR VERY BLACK AND WHITE DARK PHOTOS**
- **GRAY SCALE DOCUMENTS**

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,660	09/23/1999	MASAAKI NAKABAYASHI	684.2902	4966

5514 7590 11/12/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
----------	--------------

2872

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/401,660

Applicant(s)

NAKABAYASHI ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 21-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 21-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on August 28, 2003, which has been entered as paper number 25.
- By this amendment, the applicant has newly added claims 21-28.
- Claims 1-14, and 21-28 remain pending in this application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-14 and newly submitted claims 20-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harris (PN. 5,496,616) in view of the patent issued to Hashimoto et al (PN. 4,247,190).**

Harris ('616) teaches a *diffractive optical element* that is comprised of a *diffraction grating portion* having a *first binary diffractive optical element* (10, Figure 1) with grating structure formed on a *first substrate* (14) and a *second corrector binary diffractive optical element* (24) with grating structure formed on a *second substrate* (28). **Harris** ('616) teaches that the first and second binary diffractive optical elements are accumulated with an *air space therebetween*, (please see Figure 1 and column 5). **Harris** ('616) also teaches that the first and second substrates can be made of *different* optically transmissive materials, (please see column 9 lines 36-38). Although this reference does not teach explicitly that the largest optical path length difference to be applied to the light passing through the two diffractive elements is of an integer multiple of the wavelength of the light, such feature is either

Art Unit: 2872

inherently met or an obvious modification to one skilled in the art since such condition is the condition for the optical path length difference to induce no phase difference to the light and to *provide maximum diffraction efficiency*. A skilled worker in the art would be motivated to make the diffractive optical element satisfies this condition for achieving maximum diffraction efficiency. It is implicitly true that the maximum diffraction efficiency will occur for plurality of wavelengths in the vicinity of the design wavelength, (i.e. the wavelength used to design the grating specifics).

Harris ('616) further teaches that alignment markings could be produced at predetermined location on both of the substrates to align the two binary diffractive elements, (please see column 8, lines 16-20). However this reference does not teach explicitly that the alignment markings on the two substrates are *engaged* to each other to assure the alignment. Hashimoto et al in the same field of endeavor teaches *explicitly* to have pins (c, Figure 1(A) and 1(B)) and holes (c') formed on two optical structures (A and B), to serve as the *alignment markings*, such that the pins are *engaged* with the holes to ensure and achieve the correct alignment of the two structures, (please see column 5, lines 4-25). It would then have been obvious to one skilled in the art to apply the teachings of Hashimoto et al to explicitly use engaging pins and holes as the alignment markings to achieve the correct alignment of the diffractive grating portions of Harris for the benefit of providing the alignment markings with simple design and easy engagement. With regard to claim 24, these references do not teach *explicitly* that the alignment markings are transparent. However the transparency does not change the function of the alignment markings and such modification is considered to be obvious matters of design choice to one skilled in the for the benefit of providing the markings as desired.

With regard to claims 5, 23 and 26, although these references do not teach explicitly that the grating structures are opposed to each other however this modification is considered to be an obvious matter of design choice to one skilled in the for the purpose of obtain a diffractive optical element with desired characteristics.

Art Unit: 2872

With regard to claims 6-8 although these references do not teach explicitly that the alignment markings are of the cited geometric shapes. However such modification is considered to be obvious matter of design choices to one having ordinary skill in the art since as long as the alignment markings are capable of engaging to each other to assure the alignment the shapes have no criticality. One of ordinary skilled in the art would be motivated to design the alignment markings with the geometric shape as desired.

With regard to claims 10-11, Harris ('616) teaches that molding process may be used to form the two binary diffractive optical elements, (please see column 9, lines 39-67). Harris ('616) teaches that the diffractive optical element may be formed by pressing a mold having negative of the diffractive optical element pattern into a flat soft coating, (please see column 9). Although Harris ('616) teaches explicitly that the alignment marks are made by photolithographic process, but this reference also teaches that other conventional means may be used to make the alignment markings, (please see column 8, lines 19-20). It would therefore have been obvious modification to one skilled in the art to make the alignment markings also with the molding process since both lithographic process and molding process are conventional process for making grooves, marks or grating on a substrate and it would be more economical to make both the diffractive optical element and the alignment markings in the same molding process. Furthermore, it would also have been an obvious modification to one skilled in the art to make the alignment markings fitted to each other during the molding process for the benefit of achieving good alignment during the molding process.

With regard to claims 21 and 24, the product-by-process limitation is not given patentable weight since the process (i.e. molding process) does not differentiate the final products (i.e. the alignment markings) from the prior art disclosure of the alignment markings, the alignment markings recited in the cited references have exactly the same "engaging and alignment function" as the markings in the instant application. .

Art Unit: 2872

With regard to claims 13, 14, 27 and 28, the diffractive binary optical elements taught by Harris ('616) are optical elements that applicable in optical system. To sue it with a lens would have been obvious modification to one skilled in the art to achieve the desired optical function in the optical system.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. **Claims 1-14 and newly added claims 20-28 are provisionally rejected** under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of copending *Application No. 09/871,630*. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. **Claims 1-14 and newly added claims 20-28 are provisionally rejected** under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 13-15 of copending *Application No. 09/411,632*. Although the conflicting claims are not identical, they are not

Art Unit: 2872

patentably distinct from each other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

6. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection. The newly submitted claims 20-28 have been fully considered and they are rejected for the reasons stated in the paragraphs above.

Applicant fails to provide arguments for the double patenting rejections set forth in the previous Office Action, and such rejections therefore still hold.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.